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A SECURE REPRESENTATION TOWARDS A DATA HIDING SYSTEM

Yunuspasha Mohmad[1], Abdul Majeed[2]

[1]M.Tech Student, Dept of CSE, Lords Institute of Engineering and Technology, Hyderabad, A.P, India

[2]Associate Professor, Dept of CSE, Lords Institute of Engineering and Technology, Hyderabad, A.P, India

ABSTRACT:

The procedure of embedding data into a host medium is known as data hiding process and the structure of data hiding procedure does not rely on the host media type. A novel data hiding framework was proposed that encapsulates forbidden zone data hiding and Repeat accumulate codes in harmony with an added temporal synchronization method. It is a realistic and revealed to be advanced to the conventional quantization index modulation. The usage of Repeat accumulate codes in the data hiding of video and images appropriate to their toughness against erasures allows managing of de-synchronization connecting embedded and decoder that happen as a consequence of the differences in the selected coefficients. Forbidden zone data hiding method relies on the concept of forbidden zone concept, which is defined as the host signal range where no modification is authorized during the process of data hiding.

Keywords: Forbidden zone data hiding, Repeat accumulate codes, De-synchronization, Quantization index modulation, Data hiding

1. INTRODUCTION

The procedure of embedding data into a host medium is known as **d**ata hiding process. Even though the general structure of data hiding procedure does not rely on the host media type, the procedures show a discrepancy based on the nature of such media. In video sequences the process of data hiding can be performed in bit stream-level where the redundancies contained by the current compression standards are

demoralized. On the other hand, these methods extremely rely on the structure of the bit stream; for this reason, they quite fragile, in the intellect that in numerous cases they cannot survive any format conversion even without any important loss of perceptual superiority [4]. Hence this type of data hiding methods is normally proposed for fragile applications, such as verification. Most of the video data hiding methods make the most of uncompressed video data. An elevated volume of data hiding was projected in the videos of MPEG-2 in which the quantization index modulation (QIM) was applied to low frequency discrete cosine transform coefficients and based on MPEG-2 parameters adapted the quantization parameter [9] [11]. Depending on the type of the frame, in addition, they varied the embedding rate consequently; erasures and insertions take place at the decoder, which causes de-synchronization. Repeat accumulate codes were utilized in order to survive erasures. Each frame is processed independently in view of the fact that they modified the constraints according to category of frame [1]. A novel data hiding framework was proposed that encapsulates forbidden zone data hiding and Repeat accumulate codes in harmony with an added temporal synchronization method. It is a realistic technique of data hiding method that is revealed to be advanced to the conventional quantization index modulation [3] [6]. The usage of Repeat accumulate codes in the data hiding of video and images due to their sturdiness not in favour of erasures allows managing of de-synchronization connecting embedder and decoder that happen as a consequence of the differences in the selected coefficients [13]. The techniques for the data hiding methods of and forbidden zone data hiding and Quantization index modulation were compared by their raw decoding error performances devoid of any error improvement and are compared at the same embedding distortion and data hiding rate and noticed that forbidden zone data hiding is better more than ever at low compression bitrates and minute embedding distortion values.

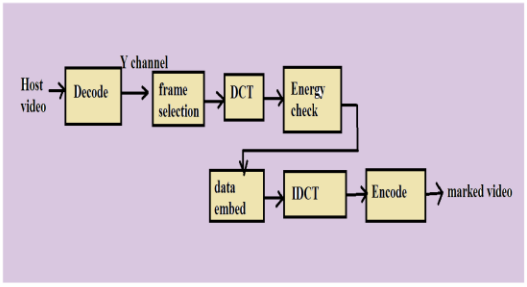

Fig1: An overview of video data hiding for a single frame.

2. METHODOLOGY:

A novel method of video data hiding was proposed that incorporates Forbidden zone data hiding method, that was revealed to be better to quantization index modulation and erasure handling through Repeat accumulate Codes and competitive with DC-QIM. Forbidden zone data hiding method relies on the concept of forbidden zone concept, which is defined as the host signal range where no modification is authorized during the process of data hiding to regulate the robustness invisibility trade-off [10]. Determining the partitions is the important point of Forbidden zone data hiding method. By using quantizers, a practical design can be performed. We make use of selective embedding to conclude the type of host signal coefficients to be made available in data hiding. We make use of block selection in which the de-synchronization is handled by means of Repeat accumulate codes and coefficient selection mutually. By means of using multi-dimensional form of Forbidden zone data hiding method in varying dimensions the de-synchronization is managed [2] [5]. To overcome local bursts of error, we make use of 3-D interleaving which does not make use of selective embedding, however uses the whole LL sub band of discrete wavelet transform [8]. Fig1 shows the embedding operation for a single frame in which Y-channel is made employed of for data embedding. Frame selection is performed initially and the frames which are selected are block-wise processed and only a single bit is hidden for each block. Energy check is carried out on the coefficients that are predefined in a mask, subsequent to obtaining 8 × 8 DCT of the block [12]. To hide data bit n which is a member of message bits, selected coefficients of unpredictable length are used. By using Repeat accumulate codes for R consecutive frames; message sequence of each group is obtained. Following the inverse transform host frame is obtained; each block is allocated to the groups. Decoder makes usage of the same system parameters and concludes.

The values of the marked signal that are to be fed to the stage of data extraction and the non-selected blocks are handled as erasures [7]. In the Frame selection step the selected number of blocks in the entire frame is counted. The ratio of blocks selected to the other blocks is exceeding a certain value then the frame is processed or else this frame is skipped. Energy of the coefficients in the mask is figured out and if the block

energy is exceeding a certain value subsequently the block is processed. Energy of each coefficient is measured to another threshold and if it is exceeding the other, then it is used during data embedding collectively with other selected coefficients in the similar block. De-synchronization takes place between embedder and decoder due to adaptive block selection, and consequently due to attacks or even embedding process decoder may possibly not perfectly decide the selected blocks at the embedder. To conquer this problem, error correction codes flexible to erasures, such as Repeat accumulate codes that are made available in the data hiding of video and image. Frame Synchronization Markers are used to conclude the frame drops, inserts and repeats, in addition to the conclusion of the assemblage of frames at which indicates all essential message bits are obtainable for Repeat accumulate decoder.

3. RESULTS:

The comparison among the techniques of data hiding of forbidden zone data hiding method and quantization index modulation was initially done and observed that forbidden zone data hiding is advanced when compared to quantization index modulation in particular for low embedding distortion levels. Both of them were compared by their raw decoding error performances devoid of any error improvement and are compared at the same embedding distortion and data hiding rate and noticed that forbidden zone data hiding is better more than ever at low compression bitrates and minute embedding distortion values. The framework was experimented with the compression of MPEG-2, H.264 scaling and the results indicating that the framework can be productively utilized in video data hiding applications.

4. CONCLUSION:

Data hiding process is the procedure of embedding data into a host medium. A novel video data hiding method was proposed that incorporates Forbidden zone data hiding method, that was revealed to be better to quantization index modulation and erasure handling through Repeat accumulate Codes and competitive with DC-QIM. Forbidden zone data hiding method relies on the concept of forbidden zone concept, which is defined as the host signal range where no modification is authorized during the process of data hiding to regulate the robustness invisibility trade-off. The usage of Repeat accumulate codes in the data hiding of video and image based on their

toughness against erasures permits managing of de-synchronization connecting embedder and decoder that happen as a consequence of the differences in the selected coefficients. The techniques of data hiding such as forbidden zone data hiding and Quantization index modulation were compared by their raw decoding error performances devoid of any error improvement and are compared at the same embedding distortion and data hiding rates and noticed that forbidden zone data hiding is better more than ever at low compression bitrates and minute embedding distortion values.

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Yunuspasha Mohmad received B tech degree in 2011 at Mahaveer Inst. Science & Technolgy and Currently pursuing M.Tech in Computer Science and Engineering at Lords Institute of Engineering and Technology affiliated to JNTU, Hyderabad. Areas of interest: Embedded system and network domain.

Abdul majeed received B tech degree in 2005 at jntuh and M tech degreein 2010 at jntuh. Currently working as associate professor in lords institute of engineering and technology, hyderabad and as 8years of exp. In teaching field , interested areas are computer networking and linux programming.